



What makes us the same and different?

Overview

In this activity you will learn about the human skeleton and footwear marks.

This activity is split into two sections they take approximately 1hr 30 mins in total. The activity involves thinking about conclusions we can make from the information given.

This activity is suitable for ages 5 - 12 years

Outline

Session 1 - Build a skeleton and forensic anthropology

In this session the group will identify the different bones in the body and then learn how we use the bones to try to attach an identity to a skeleton using forensic anthropology. What can we tell about the person from the skeleton?

Session 2 -What can your shoe tell about you? - Height and Footwear marks

In this session children will compare heights and shoe size. They will get to take a footwear mark (also called a shoe print) and compare the patterns and shapes on the soles of their shoes to each other. Do their footwear marks look similar or different to others? What can footwear marks tell us about shoe size and height of the person wearing the shoes?



Session 1

Resources

- Images of bones for identification
- Bone labels and facts
- Information sheets for anthropology
- Complete labelled skeleton
- Rulers

Introduction

Have you ever wondered what happens when human bones are found? Specially trained scientists known as Forensic Anthropologists use bones to try and help put an identity to a skeleton. They do this by looking at the bones and working out whether the bones come from a child or adult, if they are male or female and roughly what height they may have been. They can then use this information to try and match the skeleton to a person.

You can have a go at this by identifying the bones and using the information to decide what we can identify from the skeleton.

Instructions

Part 1: Making your skeleton

- 1) Can the group put the images of the bones together correctly to make a full skeleton? Make sure you try to put them at the correct sides, left and right.
- 2) Use the labels provided to name some of the bones and learn some facts!

Part 2: Information from your bones

- 1) Use the anthropology information images to see how we try to tell if the skeleton was male or female, what age they were and roughly what height they were.
- 2) Now put this into practice... can you decide if the skeleton was male or female? Child or adult? Tall or short?

Session 2

Resources

- Paper
- Rulers
- Example footwear marks (printable)
- Bluetac
- Potential: metre stick, small circular stickers, white board markers
- Video on how footwear marks can be collected with inkless pads
<https://youtu.be/9OhdZR1U29U>

Introduction

When people walk around in shoes they leave footwear marks (or shoeprints) on the surfaces they walk on. These patterns come from the sole pattern on their shoes. Many sole patterns are different from each other and can also change over time as shoes are worn. These sole and wear patterns can help forensic scientists identify particular shoes that may have left footwear marks on a surface. The length of a shoe or a footwear mark can be used as an estimate of the height of a person although this is not an accurate measurement.

Instructions

Part 1: Making footwear marks

There are two options to take footwear marks at home.

- 1) You can use a little oil, a paintbrush and some chocolate powder (printable instructions are given in the pack and a video is available here: <https://www.dundee.ac.uk/leverhulme/citizenscience/details/sole-searching.php>).
- 2) You can use water soluble poster paints and using a paint brush apply the paint to the sole of the shoe and step onto a sheet of paper to make a mark. Remember to clean the shoe afterwards!

Part 2: What size are your shoes?

- 1) What is the length of the sole of your shoe? You can measure it by drawing around your shoe on a piece of paper and measure the maximum length. You can also measure the length of the footwear mark made with your shoe (Figure 1). Are they the same or different?



Figure 1 - Taking measurements of the length of your shoe and footwear mark.

- 2) Measure your height in centimetres against the wall or a whiteboard and stick up the footwear marks from part 1 with your name (Figure 2).

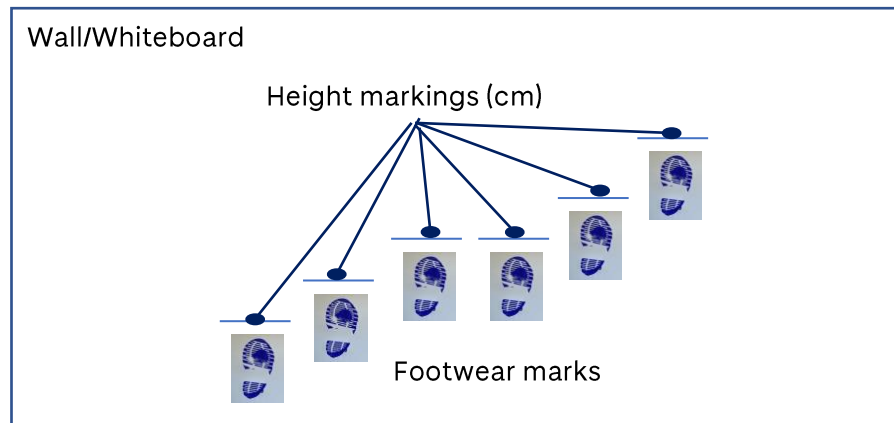


Figure 2 - Displaying the footwear marks

GROUP LEADER - Draw out a graph on large paper or a whiteboard Figure 3 (might want to have vertical line going to 30 or 35 cm if adults wish to get involved or give examples to help out).

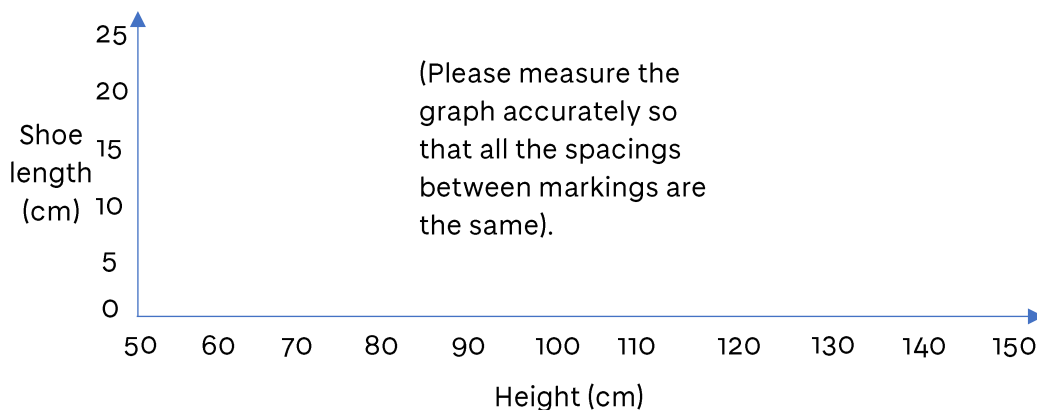


Figure 3 - Draw out graph on paper or whiteboard.

- 3) Find your height on the horizontal line of the graph and then up from your height to your shoe length (in cm) and mark it on the graph.

Some children will need a lot of assistance with this. (*How you mark depends on your medium, if white board can use white board markers, if paper then stickers if you are making a new graph for each session, or blue tac if you wish to reuse the same graph for every session*).

Hopefully, there will be a correlation between height and shoe size in that as height increases so does shoe size. You can show this correlation by using either a metre stick, tape measure or draw to show the line of best fit - line of best fit should have a roughly equal number of points above and below, but should also pass through as many as possible, (Figure 4):

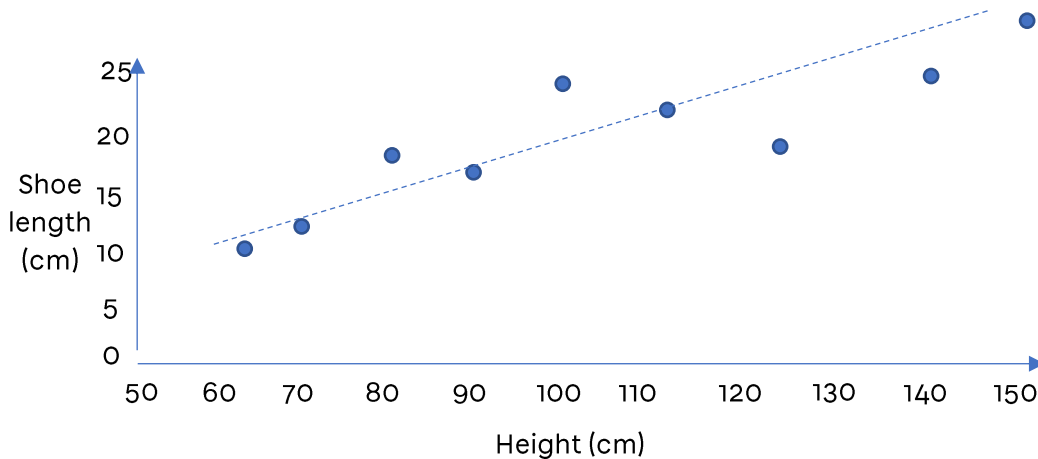


Figure 4 - Completed graph on paper or whiteboard.

Extra activity

Using the provided example footwear marks, ask the children to see if they can work out the heights of the people who made the footwear marks.

The steps the children should make:

1. Measure the length of the footwear mark.
2. Find shoe length in cm on the vertical axis of graph.
3. Go across to find the point on the line of best fit.
4. Go down from the line of best fit to find the height in cm on the horizontal axis.

About

This activity was created by researchers and staff at the Leverhulme Research Centre for Forensic Science and the Centre for Anatomy and Human Identification at the University of Dundee.

The Leverhulme Research Centre for Forensic Science is focused on research on forensic science and asks bold questions about the robustness of the science used in the investigation of crimes, laboratory analysis and the presentation of scientific evidence within the courts.

The Centre for Anatomy and Human Identification is a research and teaching group focused on anatomy and biological anthropology.

Both groups engage with public audiences via their social media pages and you can find further details below.



Email contact: LRCFSPublicEngagement@dundee.ac.uk

This activity was created by: Heather Doran, Seaneen McDougal, Niamh NicDaeid, Valentina Panci and Kathryn Burton, 2022.

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